

# Ch 2 - Proof Practice - Day 1

(I) G:  $\overline{AB} \cong \overline{CD}$   
 $\overline{BC} \cong \overline{DE}$



P:  $\overline{AC} \cong \overline{CE}$

$$\left. \begin{array}{l} \textcircled{1} \overline{AB} \cong \overline{CD} \\ \overline{BC} \cong \overline{DE} \end{array} \right\} \rightarrow \left. \begin{array}{l} \textcircled{2} AB = CD \\ BC = DE \end{array} \right\} \rightarrow \left. \begin{array}{l} \textcircled{3} AB + BC = CD + DE \\ \textcircled{4} AB + BC = AC \\ CD + DE = CE \end{array} \right\} \rightarrow \textcircled{5} AC = CE$$

$$\textcircled{6} \overline{AC} \cong \overline{CE}$$

## Reasons

① Given

② Def. of  $\cong$  segments

③ Addition Prop. of Equality

④ Segment Add. Post.

⑤ Substitution Prop.

⑥  $\cong$  segmts have = measures.

(II)  $\left. \begin{array}{l} \textcircled{1} \angle 1 \text{ \& } \angle 2 \text{ linear pair} \\ \angle 3 \text{ \& } \angle 4 \text{ linear pair} \end{array} \right\} \rightarrow \left. \begin{array}{l} \textcircled{2} \angle 1 \text{ \& } \angle 2 \text{ suppl. } \angle s \\ \angle 3 \text{ \& } \angle 4 \text{ suppl. } \angle s \end{array} \right\} \rightarrow \textcircled{4} \angle 2 \cong \angle 3$

③  $\angle 1 \cong \angle 4$

## Reasons

① Def. of linear pair

② Linear pair postulate

③ Given

④ Congruent supplements thm.: If 2  $\angle s$  supplement the same  $\angle$ , the 2  $\angle s \cong$ .

- III
- ①  $\angle 1$  &  $\angle 2$  linear pair  $\rightarrow$  ②  $\angle 1$  &  $\angle 2$  suppl.  $\angle$ s  $\rightarrow$  ③  $m\angle 1 + m\angle 2 = 180$   
 ④  $\angle 1 \cong \angle 3 \rightarrow$  ⑤  $m\angle 1 \cong m\angle 3$
- $\rightarrow$  ⑥  $m\angle 3 + m\angle 2 = 180 \rightarrow$  ⑦  $\angle 2$  suppl.  $\angle$ s

Reasons

- ① Def. of linear pair      ④ given      ⑦ Def. of suppl.  $\angle$ s.  
 ② linear pair postulate      ⑤ def. of  $\cong \angle$ s  
 ③ Def. of suppl.  $\angle$ s      ⑥ substitution

- IV
- ①  $\overline{WX} \perp \overline{WY} \rightarrow$  ②  $\angle 5$  &  $\angle 6$  are complementary  $\rightarrow$  ③  $m\angle 5 + m\angle 6 = 90$   
 ④  $\angle 5 \cong \angle 7 \rightarrow$  ⑤  $m\angle 5 = m\angle 7$
- $\rightarrow$  ⑥  $m\angle 6 + m\angle 7 = 90 \rightarrow$  ⑦  $\angle 6$  complements  $\angle 7$

Reasons

- ① Given      ⑤ Def. of  $\cong$  angles  
 ② If exterior sides of 2 adj. acute  $\angle$ s are  $\perp \rightarrow$  Compl.  $\angle$ s.      ⑥ substitution  
 ③ Def. of compl.  $\angle$ s.      ⑦ Def. of complementary  $\angle$ s.  
 ④ Given

- V
- ①  $\overline{PQ} \perp \overline{QR}$  }  $\rightarrow$  ②  $\angle 1$  &  $\angle 2$  compl.  
 $\overline{PS} \perp \overline{SR}$  }  $\rightarrow$   $\angle 4$  &  $\angle 5$  compl.  
 ③  $\angle 1 \cong \angle 4 \rightarrow$  ④  $\angle 2 \cong \angle 5$

Reasons:

- ① Given      ③ Given  
 ② If exterior sides of 2 adj. acute  $\angle$ s are  $\perp \rightarrow$  Compl.  $\angle$ s.      ④ Congruent complements  
 Theorem: If 2  $\angle$ s complement congruent  $\angle$ s, then they are  $\cong$ .